**Proposed Amendments for Consideration**

Please amend the claims as follows:

**Claims 1-40 (canceled)**

**Claim 41. (currently amended)** A method for correlating a vehicle with the road on which it travels based on cellular communication, the method comprising the steps of:

gathering a sequence of cellular network events related to ~~a~~ one or more mobile units ~~from the cellular network~~, ~~together with~~ and ~~the~~a ~~road~~ physical, geographically-defined, accurate location of ~~the~~ each mobile unit~~s~~ determined by a physical geographically-defined, accurate location determination system ~~at the timing of~~when ~~these~~ each cellular network event occurs, such cellular network events and physical, geographically-defined accurate locations being gathered~~s~~ during one or more drives and then stored as entries in ~~as a location reference and creating~~ a learnt database as a location reference; and

conducting analysis of a new sequence of cellular network events ~~data generated from communication with~~related to ~~another~~ a particular mobile unit, the new sequence of cellular network activity events being gathered during~~on~~ a new drive ~~that does~~and is independent of physical, geographically-defined ~~not contain a~~ location ~~reference~~ information, in conjunction with the learnt database to ~~match~~correlate ~~a~~ the new sequence of cellular network ~~reports~~ events to a ~~specific route~~physical geographic location;

whereas the new ~~data~~ sequence of cellular network events is extrinsically collected from the base stations or the controllers or main switching systems or communication links between them~~;~~ and

whereas the data is processed to overcome the problem of similar sequences for neighboring routes.

**Claim 42. (currently amended)** The method ~~as in~~ of claim 41, wherein the sequence of cellular network events may include a handover event and wherein~~as~~ the step of gathering a sequence of cellular network events further comprises the step of:

clustering handover chains in the learnt database according to a similarity algorithm so that each cluster contains at least similar N chains (N<=M, N=>1), where N and M may vary for different route sections.

**Claim 43. (currently amended)** The method ~~as in~~of claim 42, where~~in~~~~as~~ the similarity algorithm comprises the step of:

each of the chains in a cluster of L cells has at least K (K<=L) cells that appear in the same order as in a header, where ~~as~~ K and L may vary for different route sections.

**Claim 44. (currently amended)** The method ~~as in~~of claim 42, where~~in~~~~as~~ ambiguous chain clusters, which are clusters in which at least one of the chains has similarity to chains related to a different route section, are filtered.

**Claim 45. (currently amended)** The method ~~as in~~of claim 44, where~~in~~~~as~~ clusters have similarity if at least for one of the chains within a first cluster, ~~(1st cluster)~~ another chain is found in a second~~nother chain~~ cluster ~~(2nd cluster)~~ that ~~-~~includes at least J (J<=L) cells that appear in the same order, and this chain relates to a different route section than the first ~~second~~ cluster, where ~~as~~ J and L may vary for different route sections, ~~-~~and, if the first and second cluster have similarity, both clusters are filtered.

**Claim 46. (currently amended)** The method ~~as in~~of claim 44, where~~in~~~~as~~ a cluster has similarity to a raw data chain if at least for one of the chains within the ~~a~~ cluster, another chain is found in the raw data that includes at least J (J<=L) cells that appear in the same order, and this chain relates to a different route section than the cluster, where ~~as~~ J and L may vary for different route sections, and, the ~~chain~~ cluster having similarity is filtered.

**Claim 47. (currently amended)** The method ~~as in~~of claim 41, where~~in~~~~as in the learning phase in the learning phase~~the step of gathering a sequence of events includes calculating ~~the~~ an accuracy level of a handover ~~is calculated~~ in one or a combination of the following ways:

using signal strength measurements to detect sharp decays in signal strength resulting in a handover and thus determine handovers accuracy level;

measuring the location spread of handovers between the same cells for different trips over the same route to determine handover accuracy level and average location.

**Claim 48. (currently amended)** The method ~~as in~~of claim 41, where~~in as~~ the step of conducting analysis ~~stage~~ further comprises ~~of~~:

matching ~~cell~~ chains from new drives to the learnt database by searching for a chain of J cells that has at least K (K<=J) cells that appear in the same order, both in a chain from the new drive as well as in a chain from the learnt database, whereas J and K may vary for different route sections;

assigning the route of the chain from the learnt database to the new chain that was matched.

**Claim 49. (currently amended)** The method ~~as in~~of claim 48, where~~in as~~ the step of conducting analysis ~~stage~~ includes a secondary matching procedure comprising the step of matching cells before and after the match ~~we have~~ previously detected ~~in the initial stage~~ by following ~~the~~ raw data chains in the learnt database backward and forward relative to the matched chain and looking for an L out of M (L<=M) cells match where as M is typically smaller than J, where as L and M may vary for different route sections.

**Claim 50. (currently amended)** The method ~~as in~~of claim 41, where~~in as~~ the step of conducting ~~an~~ analysis ~~is conducted to~~ detects the vehicle location ~~in~~ at specific points along the route ~~comprises of~~ by:

extracting ~~matching~~ handover~~s (cell pairs)~~ information comprised of cell pairs, physical geographically-defined ~~of a new chain (~~location, timing, and accuracy information~~)~~ from handover chains in the learnt database that match a new chain of handovers~~that were matched with it~~; and

calculating location and accuracy of handovers in the new chain of handovers according to the handover~~s~~ information ~~from the~~ extracted ~~chains~~ from the learnt database that relate to the same route section and contain the same cell pairs.

**Claim 51. (currently amended)** The method as in claim 41, where ~~as~~ in the step of conducting analysis ~~phase after a vehicle is~~to correlate~~d~~ the new sequence of events to a specific route ~~with the road it travels on~~, further comprises conducting analysis ~~is conducted~~ to detect traffic incidents ~~as follows~~by:

if ~~the~~ another mobile unit is in a call ~~has not ended yet~~ and no new handovers have been received for a time T, ~~the~~ a distance D to ~~the~~ a farthest possible handover location to a possible next cell is used to calculate ~~the~~ a maximal possible

speed at ~~the~~ a current route section as follows: Max Speed <= D/T and if this speed is below a speed threshold S then a possible incident report is issued for this route section.

**Claim 52. (currently amended)** The method as in claim 41, wherein ~~as~~ the step of conducting analysis ~~of new drives~~ is ~~conducted~~ based only on cell ID data.

**Claim 53. (currently amended)** A method for correlating a vehicle with the road on which it travels based on cellular communication, the method comprising the steps of:

gathering a sequence of cellular network events ~~from the cellular network~~ related to one or more ~~a first~~ mobile units, ~~together with the~~ and a physical, geographically-defined, accurate location of ~~the first~~ each mobile unit~~s~~ ~~at~~ when ~~the timing of these~~ each event occur~~s~~s, and storing ~~s a location reference and~~ this information into ~~creating~~ a learnt database as location references; and

conducting analysis of a new ~~data~~ sequence of cellular network events related to ~~generated from communication with another~~ ~~another~~ a particular mobile unit on a new drive ~~that does not contain a location reference~~ independent of the physical, geographic location of the particular mobile unit in conjunction with the learnt database to identify a match ~~a sequence of reports to a specific route~~;

wherein ~~as~~ the ~~data~~ new sequence of cellular network events is processed to overcome the problem of similar sequences for neighboring routes; and

wherein ~~as~~ the step of conducting analysis is ~~conducted~~ based on extraction of handover related messages, only from the communication links between the switch and the base station controllers in a cellular network.

**Claim 54. (currently amended)** The method as in claim 41, wherein ~~as~~ the step of conducting analysis is ~~conducted~~ based on extracti~~o~~ng ~~of~~ new events from ~~only a~~ ~~different~~ different percentage of ~~the~~ calls ~~out of~~ in different parts of the cellular system.

**Claim 55. (canceled)**

**Claim 56. (currently amended)** ~~A~~ The method of ~~as in~~ claim ~~41~~42, wherein ~~as~~ the step of conducting analysis further ~~stage~~ comprises ~~of~~:

matching ~~cell~~ handover chains from new drives to handover chains in the learnt database; and

filtering out new handover chains that were matched with handover chains in the learnt database which represent more than one route section

**Claim 57. (currently amended)** The method according to claim ~~41~~42, where ~~as~~in the step of conducting analysis ~~is conducted~~ includes~~to~~ detecting ~~vehicle~~ physical geographic locations of mobile unit ~~in~~ at specific points along ~~the~~ a route~~, the analysis comprising the steps of~~by:

extracting ~~matching~~ handover~~s~~ ~~(cell pairs)~~ information ~~of a new chain~~ including cell pairs, physical geographically-defined ~~(~~location, timing, and accuracy information~~)~~ from handover chains in the learnt database for a new handover chain that ~~were~~ includes cell pairs that match~~ed~~ with ~~it~~cell pairs in the handover chain in the learnt database~~.~~; and

calculating the physical geographic location and accuracy of handovers in the new handover chain~~-~~ according to the handover information~~s~~ ~~from the~~ extracted ~~chains~~ from the learnt database that relate~~s~~ to the same route section and contain~~s~~ the same cell pairs.

**Claim 58. (currently amended)** The method according to claim 57, where~~as~~in the physical geographically-defined location, timing ~~in time~~ and accuracy ~~level~~ information is further used to calculate traffic speed per each route section.

**Claim 59. (currently amended)** The method according to claim 57, where~~in as~~ the physical geographically-defined location ~~in~~, timing~~e~~ and accuracy ~~level~~ information is used to detect traffic incidents.

**Claim 60. (currently amended)** The method ~~according to~~of claim 41, where~~in~~ the step of conducting ~~as~~ analysis ~~is conducted to~~ detect~~s~~ traffic incidents ~~, the analysis comprising the steps of~~by:

collecting handover~~'s~~ time density information for each route section;

alerting ~~on~~ of probable incident~~s~~ whenever the handover time density of a new chain~~s~~ decreases rapidly.

**Claim 61. (currently amended)** The method ~~according to~~of claim 41, where~~in as~~ the step of conducting analysis ~~is conducted to~~ detect~~s~~ incident clearance~~. This analysis comprises of~~ by:

collecting handover~~'s~~ time density information for each route section; and

notifying ~~on~~ of incident clearance whenever, after an incident, the density of new chains increases significantly.

**Claim 62. (currently amended)** The method ~~according of~~to claim 41, wherein ~~as~~ the step of conducting analysis ~~is conducted to~~ detects traffic speed~~, the analysis comprising the step of~~ by:

including a calibration stage in which traffic speed of a route section is correlated with the rate of handovers for this route section ~~on~~ at the same time; the handover~~s~~ rate is measured continuously and by comparing to the handover rate ~~of handovers~~ in the calibration stage the speed for the route section is extracted.

**Claim 63. (previously presented)** A method for correlating a vehicle with the road it travels on based on cellular communication, the method comprising the steps of:

collecting handover sequences statistics for a relevant area;

collecting road traffic volume information for each route in the relevant area from external sources for roads that differ in traffic conditions;

assigning handover sequences to routes according to volume comparison analysis; and

conducting analysis of new handover sequences from new drives in the relevant area in conjunction with the previously collected handover and traffic volume information to identify a route at certain time points during cellular phone calls.

**Claim 64. (currently amended)** The method ~~as in~~of claim 41, wherein~~as~~ the ~~method~~ step of conducting analysis is performed ~~is used~~ for areas ~~where~~ in which at least ~~2~~ two roads are covered, at least partially, by the same ~~2~~ two or more cells.

**Claim 65. (currently amended)** The method ~~according of~~to claim 41, wherein ~~as~~ virtual sensors detect the speed at certain specific locations across routes within ~~the~~ a covered area and emulate the communication protocol between traditional road sensors and the control center in a hybrid traffic control system.

**Claim 66. (currently amended)** The method ~~according to~~of claim 41, wherein ~~as~~ the step of conducting analysis further ~~analysis is conducted to~~comprises continuously updating the learnt database~~, the analysis comprising the steps of~~ by:

estimating the physical geographic location of handovers within matched sequences that do not appear in the database; and

adding new matched sequences to the learnt database

**Claim 67. (currently amended)** The method according to claim ~~41~~42, wherein the step of conducting analysis ~~as~~ further ~~analysis~~ comprises~~is conducted in order to~~ detecting changes in the cellular system and adjusting the learnt database by ~~as follows~~:

monitoring ~~during the operational stage~~ the matching rates of chains or clusters of chains ~~that their rate of matching~~ with chains in the learnt database to detect decreases in the matching rates~~significantly or are not matched at all~~;

find new clusters that were rarely matched or not matched at all, that appear in the same locations, according to preceding or following chains; and

compare statistics of the number of matches per cluster and find new clusters to replace clusters that are rarely matched.